

WHAT IS CLAIMED IS:

1. An apparatus for detecting whether a substance of interest is present in a sample of air, comprising;

an inlet for delivering the sample of air;

an ion mobility detector in communication with the inlet and operable alternately at high and low drift voltage levels for detecting whether the substance of interest is present;

at least one source of high voltage for applying a high drift voltage to the detector; and

a controller communicating with the detector and the source of high voltage for selectively reducing the voltage to the detector to a low drift voltage.

2. The apparatus of claim 1, wherein the controller is operative to switch between supplying high drift voltage and low drift voltage for each sample of air delivered by the inlet.

3. The apparatus of claim 1, wherein the controller is operative to switch from the high drift voltage to the low drift voltage only when the detector detects the presence of the substance of interest while operating at the high drift voltage.

4. The apparatus of claim 1, wherein the controller comprises a switch for selectively placing at least one resistor in communication with the detector for reducing the voltage to the low drift voltage.

5. The apparatus of claim 1, wherein the ion mobility detector is an ion trap mobility spectrometer.

6. An apparatus for detecting whether substances of interest are in any of plurality of samples of air, said apparatus comprising;

- an inlet for receiving one of the samples of air;
- a reaction chamber communicating with the inlet and operative for ionizing molecules in the reaction chamber;
- a drift tube in communication with the reaction chamber;
- a collector electrode in the drift tube at a location spaced from the reaction chamber;
- at least one field-defining electrode in the drift tube between the reaction chamber and the collector electrode;
- at least one source of voltage for applying a drift voltage across the field-defining electrode; and
- a controller for selectively switching between a high drift voltage and a low drift voltage for alternating between a high field strength and a low field strength in the drift tube.

7. The apparatus of claim 6, wherein the high drift voltage is between approximately 1,000 volts and 1,500 volts.

8. The apparatus of claim 6, further comprising a processor communicating with the collector electrode, the processor having a storage device for storing data indicative of substances of interest in the high field strength and a comparator for comparing data of ions arriving at the collector electrode when the voltage source is operated at said high drift voltage with known data for the substances of interest.

9. The apparatus of claim 8, wherein the storage device of the processor further stores data indicative of substances of interest in the low field strength, and the comparator further being for comparing data of ions arriving at the collector electrode when the voltage source is operated at said low drift voltage with known data for the substances of interest.

10. The apparatus of claim 9, wherein the controller switches from the high field strength for each of said samples.

11. The apparatus of claim 9, wherein the controller communicates with the processor and switches to the low field strength only when the processor identifies a substance of interest while at the high field strength.

12. A method for testing samples of air to determine whether any of the samples of air contain a substance of interest, the method comprising;

delivering one of the samples of air to an ion mobility detector;

operating the detector at a first drift voltage level to test for a presence of the substance of interest in the sample; and

operating the detector at a second drift voltage level to test for the presence of the substance of interest.

13. The method of claim 12, wherein the second drift voltage level is lower than the first drift voltage level.

14. The method of claim 12, wherein the step of operating the detector at the second drift voltage level is carried out for each sample of air tested by the method.

15. The method of claim 12, wherein the step of operating the detector at the second drift voltage level is carried out only when the step of testing the sample of air at the first drift voltage level identifies a substance of interest.